Wetland Mitigation at the Washington State Department of Transportation

April 28, 2004

Introduction

Recent studies have called into question the success of wetland mitigation efforts both across the United States (National Academy of Sciences, 2001) and in Washington State (Johnson *et al*. 2000, 2002). Suggested causes for mitigation site failure include poor site selection, complete or partial failure to implement plans, inadequate follow-up monitoring, lack of active site management, and insufficient compliance monitoring and enforcement by regulatory agencies. Irrespective of the cause(s) of failures, increased awareness of the challenge is causing government agencies to explore ways of improving the success of wetland mitigation.

Although none of these studies have included Washington State Department of Transportation (WSDOT) wetland mitigation sites, the Department is continuously working to create exemplary mitigation sites. The purpose of this paper is to outline the process used by WSDOT in designing, implementing, and monitoring its wetland mitigation projects in order to facilitate an assessment of WSDOT's current wetland mitigation program. This paper is also intended to illustrate the commitments that WSDOT has made towards achieving success of its wetland mitigation efforts.

WSDOT is Accountable for Transportation and Environmental Stewardship

Washington State Executive Order 90-01 mandates that the actions and activities of state agencies achieve a goal of "no net loss" of wetland acreage and function. In recognition of the "Wetlands Executive Order", WSDOT has adopted the "no-net-loss" goal as agency policy.

WSDOT makes great efforts to avoid and minimize impacts to wetlands, and is recognized as a national leader among transportation agencies in the use of new technologies to reduce impacts to aquatic habitats. Constructing crib-walls, using concrete railroad ties, and incorporating bioengineering practices are a few of the alternative technologies WSDOT utilizes to avoid and minimize environmental impacts.

WSDOT makes every effort to protect the State's ecosystems for the long-term as an integral part of accomplishing its transportation mission. Accountability and trust with natural resource regulatory agencies is maintained by following through on environmental commitments. To accomplish this, WSDOT has assembled a highly competent and experienced team of professional wetland scientists. Regional and headquarters offices employ full-time wetland biologists, aquatic ecologists, landscape architects, and hydrologists who provide technical guidance to project engineers, conduct wetland delineations and assessments, select and design new mitigation sites, as well as monitor, manage, and remediate existing wetland mitigation sites. No other private or public development entity in the state maintains such a high level of year-round, full-time wetland expertise on its staff.

WSDOT Invests in Technical Training & Professional Development

The wetlands staff at WSDOT benefit from strong support to attend classes and participate in other activities that lead to continual improvement of technical expertise. Wetlands staff participate in agency seminars, professional symposiums, and formal training.

The WSDOT Wetland Mitigation Technical Group consists of biologists and landscape architects from WSDOT regions and headquarters who work in the fields of wetland delineation and mitigation. This group holds full-day meetings five times each year to provide a forum for sharing information on emerging issues and projects across the state. The meetings involve the participation of outside guest speakers who present information on a range of special topics related to wetland science. Additionally, the WSDOT Biology Roundtable affords agency biologists another opportunity to exchange information about protecting natural resources.

WSDOT is committed to maintaining a high level of staff involvement in professional organizations and attendance at professional conferences to facilitate the transferal of new ideas and information between the Department and the scientific community. Since 2001, WSDOT biologists have attended and presented scientific papers at conferences, including the Society of Wetland Scientists (National and Pacific Northwest Chapter), The Wildlife Society, International Conference on Wildlife Ecology and Transportation, Society for Northwestern Vertebrate Biology, and Northwest Scientific Association. Moreover, WSDOT wetlands biologists have taught workshops, on the topics of wetland monitoring and introductory wetland delineation, at professional conferences.

WSDOT also provides specific training classes to its biologists to ensure that they have the technical expertise required to carry out their jobs. Since 2001, WSDOT has contracted with outside specialists to provide focused training in the areas of hydric soils, wetland hydrology, advanced wetland plant identification, endangered plant identification and ecology, salmon identification and ecology, and bull trout ecology. Moreover, WSDOT has made wetlands protection a priority throughout the agency. In 2001/2002, staff from the Headquarters Biology Program taught a "Wetlands 101" class to approximately 150 WSDOT construction, design, and maintenance employees.

WSDOT Supports Sound Technical Guidance & Research

In recent years, WSDOT has developed a number of tools and processes to ensure that its project planning and wetland mitigation activities are exemplary models of progressive compliance work. By creating and employing these mechanisms, WSDOT staff provide consistent, high-quality, science-based wetland work.

WSDOT's Biology Program researched and published a document entitled *Success Standards for Wetland Mitigation Projects—A Guideline* (Ossinger 1999) to create a cohesive and useful framework for writing "performance objectives" and "success standards" for wetland mitigation projects. The document was a culmination of two years of working with a committee of experts from Washington and Oregon to develop much needed guidance on the subject. The complete 31-page document is available on the WSDOT web page at the following URL address: http://www.wsdot.wa.gov/environment/biology/docs/success_guidelines.pdf.

Once guidance on the basic structure of wetland mitigation success standards was in place, in 1999 WSDOT initiated a two-phase project, referred to as the *Vegetation Benchmarks Study*, to

develop specific science-based success standards for the establishment of vegetation at mitigation sites. Through the collection of vegetation data at mitigation sites at various stages of development, the study focused on how quickly woody vegetation (trees and shrubs) can be established. The study was completed and the results published by WSDOT in early 2002. WSDOT staff currently use the study's findings to develop realistic mitigation site vegetation standards.

Since the nature of transportation projects presents unique situations that are often not addressed in broad national or state wetland guidance, WSDOT staff has taken the lead to initiate focused guidance where gaps exist. For instance, in 2000, WSDOT developed the *Wetland Functions Characterization Tool for Linear Projects* (Null *et al*.) in response to the need for a rapid and consistent method for characterizing wetland functions on transportation projects. The method has proven to be very useful for characterizing the functions of wetlands within WSDOT project areas.

In addition to WSDOT's own research endeavors, staff offer technical wetland expertise to other government agencies. For example, in the interest of developing a comprehensive wetland function assessment methodology, WSDOT provided technical assistance to the Washington State Department of Ecology (WSECY) in field-testing the *Methods for Assessing Wetland Functions,* both *Riverine and Depressional Wetlands of Lowland Western Washington* (Hruby *et al*., 1999a and 1999b) and *Depressional Wetlands in the Columbia Basin of Eastern Washington* (Hruby *et al*., 2000 and Hruby and Stanley, 2000). Although these methods are not yet widely used, WSDOT has since proactively applied the methodologies at two of its wetland mitigation bank sites. Between 2001 and 2004, WSDOT biologists also made significant contributions to WSECY's revised wetland rating systems for eastern and western Washington.

Wetland Mitigation Banking

WSDOT is at the forefront of the pro-active model of advanced wetland mitigation banking, an innovative alternative to concurrent, often piecemeal, mitigation. WSDOT first became interested in the concept of wetland banking in the early 1990s as it became apparent that banking provided a significant opportunity to increase the ecological benefits derived from mitigation efforts, while reducing overall costs through efficiency.

In recognition of the advantages of wetland banking over concurrent mitigation, WSDOT entered into the *Washington State Department of Transportation Wetland Compensation Bank Program Memorandum of Agreement* (CBMOA) with state and federal wetland regulatory agencies in 1994. The agreement provides the principles and procedures for establishing, implementing, and maintaining WSDOT wetland mitigation banks. Signatories to the CBMOA include U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, National Marine Fisheries Service, Federal Highway Administration, Ecology, Washington Department of Fish and Wildlife, and WSDOT. Mitigation bank development is currently based on criteria outlined in the WSDOT CBMOA, Federal Guidance for the Establishment, Use and Operation of Mitigation Banks (60 FR 58605-58614, November 28, 1995), and the Washington State Draft Rule on Wetland Mitigation Banking (WAC 173-700).

WSDOT currently has two existing wetland mitigation bank sites including the Moses Lake Mitigation Bank in Grant County, which was approved in 2002, and the North Fork Newaukum Mitigation Bank in Lewis County, which is expected to gain approval in mid-2004. WSDOT

designed the North Fork Newaukum Mitigation Bank to target a limiting factors analysis for salmon in the upper Chehalis River watershed. This site is also located well away from the I-5 corridor and increases habitat connectivity along the North and Middle forks of the Newaukum River. The location of the bank in the watershed provides the opportunity to increase wetland and riparian functions in a degraded floodplain where the potential for functional gain surpasses most small sites suitable for concurrent mitigation projects. WSDOT is currently developing a third site, the Greenhill Mitigation Bank, also located in Lewis County. The proposed widening of I-5 could utilize most credits provided by the Lewis County mitigation banks.

WSDOT Measures and Reports on Performance

After WSDOT avoids or reduces impacts to wetlands, as well as designs and creates mitigation sites for unavoidable impacts, WSDOT employs a monitoring program that is a national leader for providing statistically sound reporting on mitigation site performance to regulators and site managers. Based on quantitative data collection techniques are based on standard ecological and biostatical methods described in Bonham (1989), Elzinga (1998), Krebs (1999), Zar (1999), and other sources. Environmental monitoring provides a means for tracking the development of all WSDOT mitigation projects over time, and for determining compliance with permits issued by federal, state, local, or tribal jurisdictions. By reporting on the development of mitigation projects, WSDOT's Monitoring Program provides an essential link in the internal adaptive management process, empowering regional WSDOT environmental personnel to make sound decisions regarding present and future mitigation projects.

Monitoring usually begins the first year after planting of a mitigation site and continues annually as required by regulatory permits (typically 5–10 years). WSDOT biologists conduct monitoring activities from May through October with the help of approximately 16 graduate students and upper-level undergraduates. The students are enrolled in an eleven-week internship program entitled *Wetland Ecology and Monitoring Techniques*, as part of a unique ongoing partnership with The Evergreen State College. To address permit requirements and site-specific success standards, data is collected on a variety of environmental parameters including vegetation, hydrology, soils, wildlife, and benthic macroinvertebrates. Detailed monitoring reports are submitted annually to the U.S. Army Corps of Engineers, WSECY, and other appropriate local, state, and federal governmental agencies. Moreover, monitoring data are incorporated into WSDOT's decision-making process to determine appropriate management actions and to ensure that the intended ecological functions are attained prior to the end of the monitoring period.

WSDOT Funds and Implements Remediation Work

WSDOT has set up an environmental remediation account to address problems identified at its wetland mitigation sites. These monies are spent to ensure that wetland mitigation sites are in conformance with success standards and permit conditions. Moreover, funds from this account are not limited to bringing projects into compliance, but may also be spent to address emerging problems identified during mitigation site monitoring. WSDOT regional office staff also use remediation funds to conduct annual adaptive management of mitigation sites including mechanical and chemical weed control, replanting, hydrology management, supplemental plant watering, biological control agent release, and experimental plots of planting techniques, plant protectors, and soil amendments.

Summary

As a public agency, WSDOT is accountable for both transportation and environmental stewardship. WSDOT has established a comprehensive wetlands program to ensure that unavoidable impacts associated with its projects are compensated in an ecologically responsible manner. A few of the more significant elements of the WSDOT wetland program include:

- Maintaining a highly trained staff of wetland scientists and landscape architects to oversee the design, construction, and monitoring of its wetland mitigation sites;
- Continually improving the technical proficiency of its wetland biologists and landscape architects through forums, training classes, workshops, and participation in professional organizations;
- Researching and developing technical guidance that will lead to improvements in wetland mitigation efforts;
- Providing leadership in advance mitigation, including wetland banking;
- Setting the standard of excellence in wetland monitoring and reporting;
- Implementing site management and remediation activities when monitoring reveals a need.

WSDOT remains steadfastly committed to playing a leadership role in all areas of wetland mitigation in Washington State.

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